

Self-Injurious Behavior in a College Population¹

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ABSTRACT

Background: Self-injurious behaviors (SIB) are those in which an individual purposefully inflicts harm to his or her body for purposes not socially recognized or sanctioned and without the obvious intention of committing suicide. Despite the widespread concern that the practice is increasing there exists no reliable estimate of the prevalence, forms, and correlates of SIB among the general U.S. adolescent and young adult population.

Objective: To assess the prevalence, forms, and demographic and mental health correlates of self-injurious behavior in a representative college sample.

Methods: A random sample of undergraduate and graduate students at two northeastern American Universities was invited to participate in a web-based "Mental Health and Well-Being" survey in spring of 2005. Thirty-seven percent of the 8,300 invited participants responded. Self-reports of prevalence and incidence of self-injurious practices, age of onset, forms, severity, intention, and help-seeking were examined. Persons with and without a history of SIB were compared on demographic characteristics, history of physical, sexual or emotional abuse, suicidal ideation or behavior, disordered eating, psychological distress, and help-seeking behaviors.

Results: The lifetime prevalence rate for having at least one SIB incident was 17.0%. Seventy-five percent of those engaged in SIB more than once. Thirty-six percent reported that no one knew about their SIB and only 3.29% indicated that a physician knew. Compared with non-self-injurers, those with repeat SIB incidents were more likely to be female (AOR, 1.5, 95% CI, 1.2-2.0), bisexual (AOR, 4.7, 95% CI, 2.8-7.7) or questioning their sexual orientation (AOR, 2.8; 95% CI, 1.5-5.0), or to be living with two parents one of whom was a step-parent (AOR 1.8, 95% CI, 1.1-3.2). They were less likely to be Asian/Asian American (AOR .6, 95% CI, .5-1.0)

and over 24 years of age (AOR, .7, 95% CI .5-1.0). When controlling for demographic characteristics, those with repeat SIB incidents were more likely to report a history of emotional abuse (AOR 3.6, 95%CI 2.6-5.1), sexual abuse (AOR, 1.8, 95% CI, 1.2-2.8), ever having considered or attempted suicide (AOR 7.4, 95% CI, 5.4-10.1), elevated levels of psychological distress (AOR 3.5, 95% CI, 2.2-5.7), and one or more characteristics of an eating disorder (AOR, 2.0; 95% CI, 1.5-2.7). A dose-response gradient was evident in each of these areas when single incident SIB was compared to repeat incident SIB.

Conclusions: A substantial number of college students reported self-injurious behaviors in their lifetimes. The mean age of onset for those reporting SIB was between 14 and 15 years of age. Most report a duration of less than five years. Much of the behavior is occurring in individuals who have never been in therapy for any reason and who only rarely disclose their SIB to anyone. Number of SIB incidents shows a dose-response gradient with single SIB incidents correlated with history of abuse and comorbid adverse health conditions, but less strongly than those with repeat SIB incidents. The reticence of these clients to seek help or advice renders it critical that medical and mental health providers find effective strategies for detecting and addressing SIB.

Key Words: self-injury; young adults, mental health

INTRODUCTION

Self-injurious behaviors (SIB) are those in which an individual purposefully inflicts harm to his or her body for purposes not socially recognized or sanctioned and without the obvious intention of committing suicide.^{1, 2} The current study seeks to expand upon the small body of knowledge available related to the prevalence, nature, and correlates of SIB in a college population. It is the largest U.S. study conducted on SIB in this population and raises important questions about SIB detection, treatment, and prevention.

Although sometimes assumed to be a form of suicidal behavior, SIB is by definition an act which occurs without suicidal intent.³⁻⁵ In his characterization of SIB as an impulse control disorder known as the "deliberate self-harm syndrome⁶," Favazza identifies three major forms of non-socially sanctioned SIB: major, stereotypic, and superficial/moderate. The first two forms are rare and/or seen primarily in psychotic populations. The form of SIB most common in the non-clinical population falls into the last category and can be episodic or repetitive. Existing studies suggest that the average age of onset for SIB in clinical populations peaks in mid to late adolescence followed by a decline in early adulthood.⁷⁻⁹ Although SIB is most often associated with the term "cutting" it encompasses a wide variety of behaviors including but not limited to carving or cutting of the skin and subdermal tissue, scratching, burning, ripping or pulling skin or hair, swallowing toxic substances, bruising, and breaking bones.

Despite the widespread concern that the practice is increasing in adolescent and young adult populations^{10, 11}, there exists no reliable estimate of the prevalence of SIB among the general, non-clinical, U.S. adolescent and young adult population. What is known is derived from clinical samples or is not differentiated from suicide-related behaviors. For example, while the Center for Disease Control tracks self-inflicted injury through emergency room data, it does

not differentiate between self-inflicted injuries with and without suicidal intent.¹² The few studies which have been conducted in U.S. community samples of adolescents and young adults are limited by the use of small convenience-based samples. Estimates of SIB prevalence in these studies vary widely and range from 12% to 38% percent.^{3, 13-15} Much larger studies conducted in the UK and Australia find prevalence rates in high school students which range from 5% to 13%.¹⁶⁻¹⁹

The relationship between suicide and SIB is complex. Although most studies suggest that SIB is a method of temporarily alleviating distress, in clinical populations persons who engage in SIB are more likely to also engage in suicide-related behaviors.²⁰⁻²⁷ SIB is also associated with eating disorders, a history of abuse or trauma, and psychological distress in clinical populations.²⁸⁻³¹ There is some evidence of these associations in non-clinical populations as well.^{3, 13, 32}

There are few or conflicting findings about the association between SIB and gender, ethnicity, or SES. Nor has research been conducted to date which examines the association between SIB and other demographic factors such as adolescent family composition or sexual orientation. For example while some research suggests that females are 1.5 to 3.0 times more likely to self-injure than males^{8, 33}, other studies suggest that the gender gap may be narrower than this.^{7, 34-37} Similarly, research findings linking race and SIB are mixed, with some studies suggesting that it may be more common among Caucasians³⁸⁻⁴⁰ and others showing similarly high rates in minority samples.^{30, 41} Although parallels between SIB and eating disorders have led some to speculate that SIB is likely to be most prevalent among middle and upper income individuals⁴², no existing research supports this contention. Indeed, other researchers have reported SIB in low income populations as well.⁹ There is some evidence linking SIB to sexual

orientation such that incidence of SIB is elevated among those who report exclusive homosexual attraction and some same sex attraction.⁴³

METHODS

Sample

A random sample of 8,300 undergraduate and graduate students (33.7% of the total combined population) from two northeastern Universities was invited to participate in a web-based survey, “Survey of College Mental Health and Well Being,” in the spring of 2005. The sample was drawn by the University registrar using software designed for that purpose. The demographic profile of those invited was identical to the whole student population in both Universities. Invitees were sent a postcard alerting them to the study. This was followed by an e-mail letter containing descriptive information and a link to the survey. A total of 3,069 (36.9%) individuals completed the survey. Cases in which a majority of the responses were missing were eliminated (n=115). Cases in which SIB status was not determinable due to missing data (n=65) were also excluded from these analyses. A total of 2,875 (34.6%) were retained for analysis. Sample demographics were largely representative of the overall student population although there were significantly more females (56.3% CI, 54.6 -58.1 vs. 47.6%) than in the population from which they were drawn.

Study Design and Questionnaire

All participants completed demographic items and a series of questions which assessed a variety of risk factors and comorbid conditions known to be linked with self-injurious behavior in clinical populations or community surveys. All participants also answered a set of questions about recent psychological distress, suicide-related behaviors, and help-seeking behaviors.

Assessment of Self-Injurious Behavior

All respondents received a screening question for self-injurious behavior which asked “have you ever done any of the following *with the intention of hurting yourself?*” A list of 16 self-injurious behaviors (described in the results section) was then presented. These were identified through examination of existing SIB surveys^{44, 45} (A. R. Favazza, written communication, July 2004), a review of existing literature, and interviews the study team conducted with mental health providers and self-injurers. Individuals were later asked about suicidal intent. Those who selected “to practice suicide” or “to commit suicide” were omitted from the SIB category since by definition SIB is an act undertaken without suicidal intent.

Lifetime frequency of SIB, age of onset, current SIB status, perceived severity, body parts affected, and formal help-seeking were also assessed. All of these questions were developed specifically for this study. Perceived severity was assessed using four questions: a) b) “Have you ever intentionally hurt yourself more severely than you expected?”, c) “How many times have you intentionally hurt yourself more severely than you expected?”, d) “Have you ever intentionally hurt yourself so badly that you should have been seen by a medical professional (even if you were not)?”, “Have you ever sought medical treatment (not therapy) for any of the injuries you intentionally caused?” Help seeking was assessed by asking respondents to indicate whether a) anyone knew about their SIB even if they had not discussed it with them, b) they had ever been in psychotherapy for any reason (not including family or couples therapy), and c) they had ever disclosed or discussed self-injurious behavior with a mental health professional, physician, or other health care provider.

Correlates of Self-Injury

Demographic characteristics and conditions known or believed to be comorbid with SIB in clinical populations were measured. These included gender, age, international student status,

race/ethnicity, father's and mother's education level (used as a proxy for socioeconomic status), sexual orientation, and family composition during high school. Following the U.S. census codes, race/ethnicity codes included: non-Hispanic black, non-Hispanic white, and Hispanic. An Asian/Asian American category was included to reflect the significant number of Asian/Asian Americans in each University. The "other" category included American Indian / Alaskan Native, Middle Eastern or East Indian, Native Hawaiian or Pacific Islander, Bi-racial/ethnic or Multi-racial/ethnicity. These categories were collapsed into four groups for purposes of the following analyses: Caucasian, Black, Asian, and Other. Sexual orientation included four response options: straight, gay or lesbian, bi-sexual, and questioning. Participants were allowed to select all that applied. For the purposes of these analyses, the 51 respondents who chose two or more sexual orientations were categorized as "questioning."

Respondent reports of suicidal ideation, gestures, behaviors, and attempts, eating disorders, history of abuse, and mental distress were also elicited. Lifetime suicide-related behaviors were measured using a binary response option taken from a study conducted by Savin-Williams and Ream⁴⁶ which asked "Have you ever seriously considered suicide or attempted suicide?" A binary variable reflecting the presence of four DSM-IV characteristics of disordered eating was coded positively if respondents indicated that they had ever repeatedly: a) severely restricted eating, b) binged or purged, c) over-exercised to lose or manage weight, or d) used laxatives to lose or manage weight. Mental distress in the past 30 days was assessed using the K-6.⁴⁷ Presence or absence of abuse history was measured using three questions developed for this study, "Have you ever been in a physically abusive relationship (including family relationships, romantic relationships, acquaintances, or friendships)?", "Have you ever experienced sexual touching or penetration against your will?", and "Have you ever been in a relationship that was

emotionally abusive (including family relationships, romantic relationships, acquaintances, or friendships)?”

Statistical Analyses

All analyses were conducted in SPSS version 13 (SPSS Inc., Chicago, Ill.). Descriptive statistics, crude odds ratios, and adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were used to examine the relationship between SIB and all correlates. Odds ratios were obtained from binary logistic regression equations with two dichotomous outcomes: a) a single reported SIB incident versus no SIB incident and b) repeated SIB incidents versus no SIB incident. Predictors included all demographic variables, history of abuse, and presence of mental health conditions including mental distress, eating disorder, or suicide-linked behaviors. All models were run first using univariate logistic regression. This was followed by multivariate logistic regression analyses to produce an adjusted OR, controlling for all demographic characteristics.

RESULTS

Study Population

As shown in Table 1, the sample contained more females than males and was largely between the ages of 18-24. Over half were White with Asian / Asian American being the next most represented ethnic/racial category. Over 80% were attending college as a domestic, rather an international, student. A majority of the study population reported that their mother and father had a college education and over half reported living with both parents in high school.

 Insert Table 1 about here

Self-Injurious Practices

As shown in Table 2, of the 2,875 individuals included in these analyses, 490 (17.0%, CI 15.5 – 18.3) reported having practiced SIB without suicidal intent at some point in their lives. The 12 month prevalence rate for SIB was 7.3% (n=210). Another 9.7% (n=280) had not practiced SIB in a year or more and rated it somewhat unlikely or very unlikely they would do it again in the future. The majority (74.6%) of those who had self-injured indicated that they had engaged in the practice two or more times. They reported an average age of onset between 15-16 years of age. Of repeat self-injurers who reported having stopped the behavior (n=179), 79.8% reported ceasing SIB within five years of starting; 40% (n=71) report stopping the behavior within 1 year of starting.

 Insert Table 2

Twenty one percent (n=102) of all self-injurers indicated that they had injured themselves more severely than expected on at least one occasion; 47.0% of these reported having injured themselves more severely than expected more than once. A total of 9.9% (n=12) of all single SIB incident respondents and 25.4% (n=88) of repeat SIB incident respondents indicated that they hurt themselves so badly that they should have been seen by a medical professional. Overall, 6.5% (n=32) of all self-injurers sought medical help for their injuries.

Help-seeking among self-injurers was notably low. Nearly 40% of all of SIB respondents reported that no one was aware of their self-injurious behavior; among repeat SIB respondents (n=346) this figure was 31%. Very few self-injurers (4.6%) disclosed SIB to a physician or allied medical health professional and less than one-quarter (21.4%) reported disclosing or discussing SIB with a mental health professional. Among repeat self-injurers, 5.4% disclosed SIB to a physician or allied medical health professional and 25.7% reported disclosing or discussing SIB with a mental health professional. Just over half (57.1%) of repeat self-injurers had ever been to therapy for any reason.

Table 3 describes specific forms and body locations affected most often by self-injurers.

 Insert Table 3 about here

In addition to those shown, self-injurers reported having engaged in fighting or other aggressive activities with the intention of getting hurt (5.7%); tried to break bone(s) (4.1%), ingested a caustic substance(s) or sharp object(s) (1.6%); broken bones (1.2%) dripped acid onto skin (1.2%); and/or mutilated genitals or rectum (0.6%). In addition to the body locations listed, self-injurers were most likely to report the face (7.1%), feet (4.9%), shoulders (2.9%), lips (2.0%), back (1.4%), genitals (1.4%) and buttocks (.8%), as affected sites. Sixty percent of those who engaged in SIB reported experience with more than one form of the behavior. Of those reporting repeat SIB incidents, 70% used multiple methods to self-injure, with the majority (51.4%) reporting using between 2-4 methods. Just over half (57.6%) of all self-injurers and just under 70% of repeat SIB incident respondents reported affecting more than one area with self-injurious practices

The most common methods reported by both males and females were scratching or pinching with fingernails or other objects to the point that bleeding occurs or marks remain on the skin; banging or punching objects to the point of bruising or bleeding; cutting; and punching or banging oneself to the point of bruising or bleeding. Females however, were 2.3 (95% CI, 1.4-3.9) times more likely to scratch or pinch, and 2.4 (95% CI, 1.3-4.2) times more likely to cut. Males were 2.8 (95% CI, 1.5-5.0) times more likely than females to punch an object with the intention of injuring oneself. Males were 1.8 times (95% CI, 1.1-3.1) more likely to injure their hands while females were 2.3 times (95% CI, 1.7-4.6) more likely to injure their wrists and 2.4 times (95% CI, 1.2-4.4) more likely to injure their thighs.

Demographic, Abuse History, and Mental Health Condition Correlates of SIB

Few demographic characteristics were associated with single and multiple SIB incidents. Adjusted odds ratios (AORs) for demographics comparing single SIB incident with no SIB incident showed that individuals with a single SIB incident were more likely to report their sexual orientation as bisexual (AOR 2.7, 95% CI 1.1-6.5) or questioning (AOR 3.5, 95% CI 1.5-8.2) and to report international student status (AOR 1.7, 95% CI 1.0-2.3). Compared with those with no SIB, respondents with repeat SIB incidents were significantly more likely to be female than male (AOR, 1.5, 95% CI, 1.2-2.0). They were also more likely to be bisexual (AOR, 4.7, 95% CI, 2.8-7.7) or questioning their sexual orientation (AOR, 2.8; 95% CI, 1.5-5.0) than to be straight, and more likely to live with two parents one of whom was a step-parent. They were also less likely to be over 24 than in the 18-20 years of age range (AOR, .7, 95% CI .5-1.0). Although there was a very modest significant effect for ethnicity for repeat SIB incidents when Caucasian was contrasted with all other ethnic groups reported (AOR, .8, 95% CI, .6-1.0), the only specific

group to show significantly less repeat SIB incidents than Caucasian respondents were Asian or Asian Americans (AOR .6, 95% CI, .5-1.0).

Overall, 53.3% of all self-injurers reported having experienced physical, sexual, and/or emotional abuse (see Table 4).

 Insert Table 4 about here

Twelve percent (n=62) of all self-injurers reported physical abuse, 20% (n=99) reported sexual abuse, and 44% (n=215) reported emotional abuse. Crude ORs showed that individuals with a single SIB incident were significantly more likely to report a history of emotional and sexual abuse than individuals with no SIB. However, only emotional abuse remained significant in the multivariate model. Respondents with repeat SIB incidents were significantly more likely to report a history of emotional, sexual, and physical abuse, with emotional abuse and sexual abuse remaining significant in the multivariate model. These effects did not differ for males and females.

Descriptive and multivariate analyses for no SIB, one incident SIB, and repeat SIB and suicidal behavior, elevated levels of distress, and characteristics of an eating disorder are shown in Table 5.

 Insert Table 5 about here

Of all self-injurers, 75.9% reported having considered or attempted suicide, reported elevated levels of distress (K-6 score >13) in the last 30 days, and/or had at least one characteristic of an

eating disorder. Specifically, 34.2% (n=160) of all self-injurers also reported having considered or attempted suicide, 51.6% (n=253) reported elevated levels of distress in the last 30 days, and 28.1% (n=187) reported at least one characteristic of an eating disorder. The prevalence of each mental health condition increased from no SIB, to single incident SIB, to repeat SIB (see Table 5). Persons with a single SIB incident were significantly more likely to report suicidal thoughts and behaviors, and elevated levels of distress in the past 30 days than persons with no SIB. Respondents with repeat SIB incidents were significantly more likely than no SIB respondents to report suicidal thoughts and behaviors, high distress levels, and one or more characteristics of an eating disorder.

DISCUSSION

There is a widely held belief that SIB is increasing in prevalence in the general adolescent and young adult population. Although lack of adequate empirical data in earlier cohorts prevents empirical testing of this assumption, trends among this age group in other indicators of mental health suggest that this perception may be well founded. For example, findings from national study of youth with intentional self-inflicted injuries taken from community hospital inpatient utilization data from 1990-2000 showed an increased rate of cutting (from 4.3% to 12.2%) and more severe psychiatric diagnoses that were treated with shorter inpatient stays.⁴⁸ Youth suicide rates have increased 36% since 1970 and 150% since 1950⁴⁹ and in a recent meta-analysis of anxiety in the U.S. population, Twenge⁵⁰ found that the average U.S. child reported more anxiety than psychiatric patients in the 1950's. Likewise, data from the National Comorbidity Surveys show strong cohort effects for major depressive disorder, with the youngest cohorts showing increased disorder.⁵¹ A 2003 National Survey of

Counseling Center Directors at colleges and universities in the U.S. found that 81.4% reported seeing more students with serious psychological problems than just five years ago.⁵² These findings are consistent with national trends in the general population showing increased use of mental health services over the past decade.⁴⁸ SIB communities on Internet Message Boards are now prevalent, frequently visited and potentially provide a vehicle for spreading the practice.⁵³ The tendency for SIB to follow epidemic-like patterns in institutional settings such as hospitals and detention facilities⁵⁴⁻⁵⁷ and to become somewhat addictive⁵⁸ may be reflected in non-clinical settings as well, such as high schools and colleges. Although any one of these trends may be artifacts of other changes, taken as a whole, they suggest a concerning trend.

In this context, the current study is an important step in understanding the scope and nature of self-injurious behavior without suicidal intent and related help-seeking in a college population. Our prevalence rate of 17% is consistent with other studies and suggests that SIB in this population does warrant serious consideration. Three quarters of those reporting SIB indicated that they had practiced it on two or more occasions and report engaging in a wide variety of practices. This finding is not entirely consistent with existing literature based on clinical populations, which finds a much higher rate of repeat SIB.⁵⁹

SIB is popularly assumed to be a female phenomenon. This assumption is not fully supported by existing literature.⁶⁰ In addition, many SIB studies have been conducted in clinical settings where women are overrepresented. Our findings do show that significantly more females than males engaged in SIB, but these gender effects only applied to repeat SIB incidents and were not strong (ORs < 2.0). The fact that SIB is popularly associated with “cutting” may account for the belief that SIB is a female phenomenon since we did find that women were more likely than men to cut.

Few other demographic characteristics strongly predicted SIB. Bisexual or questioning sexual orientation was significantly related to both single SIB and repeat SIB incidents, although the number of such individuals was small. Homosexual and heterosexual sexual orientations were not associated with SIB status. Although other studies have found homosexual individuals at greater risk for SIB⁴³, this may be an artifact of the fact that suicidal behaviors were included in their definition of SIB. International students were more likely than domestic students to report a single SIB incident, but this may be a byproduct of small sample sizes since the effect is reversed with repeat SIB incidents. Overall, we cannot conclude that international students were more at risk for single SIB incidents.

Our finding that the majority of SIB respondents report an age of onset in the middle adolescent years is similar to other studies.⁵⁹⁻⁶¹ Consistent with the assumption that SIB is an increasingly popular method of regulating distress for adolescents and young adults, we found that respondents over the age of 24 were slightly less likely to report the behavior than the younger cohorts. This effect, however, was not strong. Moreover, although the sample contained graduate students the majority of these were below the age of 30 and perhaps similar to the younger cohorts. Despite the tendency for the behavior to be concentrated in the adolescent years, the variation in age of onset suggests that there may be different developmental trajectories in SIB.⁶⁰ Investigation of these differences may yield important information useful in clinical detection and treatment.

Our findings suggest that the detection and treatment of SIB is remarkably low. Despite the fact that one in five respondents reporting SIB indicated that they had injured themselves more severely than expected or badly enough that they should have received medical treatment, very few ever sought medical help. This low level of engagement with health providers among

self-injurious individuals is similar to other community-based studies of school-aged children in the UK and Australia.^{16, 17} The tendency to avoid professional help-seeking was also echoed in the findings related to informal help-seeking as well. These findings reinforce the contention that SIB is a practice which generates shame and is often experienced as very isolating. The fact that so many of those who self-injure were clearly functioning well enough to go undetected by the healthcare system poses important questions about whether those practicing SIB in a college population are likely to disproportionately suffer poor future outcomes compared to non-self-injurious youth. The strong association with suicide-related behaviors and heightened distress suggest so, but future study on other measures of well-being, such as academic performance, is needed.

Those who engaged in SIB were more likely to report elevated distress scores. This is similar to community studies which have shown self-harm to be associated with psychiatric disorders.⁶² SIB is widely recognized as a method of coping with distress^{14, 25} and some view it as a highly functional alternative to suicide.^{1, 42} Nevertheless, our study, like those documenting a relationship between SIB and suicide in clinical studies²⁵⁻²⁷ showed a definitive link between the two behaviors. The findings do not provide evidence that SIB is part of a continuum of suicidal behavior, only that it may signal underlying unresolved distress. Indeed, 66% of all those who have engaged in SIB reported never having considered or attempted suicide.

Consistent with other research^{7, 9, 34, 63, 64}, a history of abuse was correlated with SIB, although this varied by type of abuse. Physical abuse was unrelated to SIB once controls were added to the models. Emotional abuse was related to both single incident and repeat SIB, while sexual abuse was more prevalent among respondents with repeat SIB. Our finding that emotional abuse was a more powerful predictor of SIB status than sexual abuse is not consistent with

existing literature, perhaps because emotional abuse has been largely defined as parental neglect.^{30, 60} Our findings also suggested that gender did moderate these effects.

The results presented here should be considered in light of four limitations. First, the response rate, while typical of web-based surveys⁶⁵, was not as high and may have biased the results in unknown ways. Although the sample was large and mostly representative of the population of students from which it was drawn, it did contain significantly more females than the college population. This may have slightly biased the overall estimates of SIB upward in the case of gender. Second, the external validity of the data is limited by sampling from two elite universities in the Northeast. When compared to the national American College Health Association (ACHA) Assessment for 2003 the sample for the two schools in this study was similar to the national student population in terms of sexual orientation and involvement in fraternal organizations. However, our sample contains more graduate students, international students, males, and minority students.⁶⁶ A regional bias is unlikely to be great since there are not strong regional differences in conditions that correlate with SIB such as major depressive disorders or suicide-related behaviors.^{51, 67} Moreover, research shows no difference in rates of suicide at colleges when compared on selectivity, competitiveness, or prestige.⁶⁸ Third, our findings may not generalize to the non-college population of persons in this age group or to younger cohorts (e.g. middle and high school students). It is possible that non-college bound youth may be at higher risk for SIB since studies have shown that self-harm that includes suicide attempts is more prevalent in those with less educational achievement and lower socioeconomic status.^{4, 67} However, SIB is often compared to eating disorders, a practice which shows no clear SES trend.^{69, 70} If SIB is increasing in prevalence among younger cohorts, students now in middle and high school may ultimately have a higher lifetime prevalence than the college

population we studied. Lastly, our findings cannot definitively date the onset of SIB relative to the presence of risk factors such as emotional abuse or comorbid conditions such as eating disorders or suicide-related behaviors.

In closing, this study marks a needed step forward in assessing SIB prevalence and practices in a community sample of adolescents and young adults. Our findings suggest that medical providers and therapists see a significant number of adolescents and young adults that they may fail to recognize as self-injurious. Some of these are at heightened risk for severe distress and suicide-related behaviors. The reticence of those who practice SIB to seek advice from anyone makes it critical that medical and mental health providers find effective strategies for recognizing, treating, and preventing SIB. Existing interview tools such as the HEEADSSS (which contains a single optional question on SIB)⁷¹ and the American Medical Association's Guidelines for Adolescent Preventive Services (GAPS) are useful first steps in detecting SIB in clinical settings. However, in light of the current evidence, a more expanded inquiry about self-injurious behaviors might be considered a standard and necessary part of all routine history and physical examination of the later adolescent and early young adult patient. Clearly, more research into the root causes of, detection, prevention and treatment of SIB is a public health imperative.

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Table 1. Characteristics of Study Participants (n=2875)*

Characteristic*	No. (%)
Sex	
Female	1618 (56.3)
Male	1245 (43.5)
Age	
18-20	1142 (39.7)
21-24	958 (33.3)
Over 24	756 (26.2)
International student status	
Domestic	2339 (81.9)
International	516 (18.1)
Race/ethnicity	
Non-Hispanic white	1853 (64.7)
Non-Hispanic black	106 (3.7)
Hispanic	124 (4.3)
Asian / Asian American	491 (17.1)
Other	291 (10.2)
Father Education	
Less than high school	109 (3.8)
High school	184 (6.5)
Some post-high school	284 (10.0)

Table 1 (cont). Characteristics of Study Participants (n=2875)*

Characteristic*	No. (%)
College graduate	2258 (79.7)
Mother Education	
Less than high school	118 (4.2)
High school	235 (8.2)
Some post-high school	387 (13.5)
College graduate	2118 (74.1)
Sexual Orientation	
Heterosexual	2629 (92.3)
Homosexual	63 (2.2)
Bisexual	83 (2.9)
Questioning	74 (2.6)
Family Composition While in High School	
Lived with both parents	2316 (80.7)
Parent and step parent	96 (3.3)
One parent	289 (10.1)
Grand parents or other relatives†	174 (6.0)

* Sum of subgroup numbers may not be equal to total N as a result of missing data.

† This category reflects individuals who indicated that they lived with other relatives, on their own, with friends, or at boarding school for most of their high school years.

Table 2. Description of Self-Injurious Behaviors (n=490)

Characteristic	No (%)
Frequency and Age of Onset*	
Lifetime frequency	
Once	118 (25.4)
2-5 times	154 (33.2)
6-10 times	72 (15.5)
11-20 times	45 (9.7)
Over 21 times	75 (15.2)
Age of onset	
Childhood (< 10)	24 (5.1)
Early adolescence (10-14)	118 (24.9)
Middle adolescence (15-16)	128 (27.0)
Late adolescence (17-20)	161 (34.0)
Early adulthood (21-24)	22 (4.6)
Adulthood (> 24)	21 (4.4)
Severity	
Hurt more severely than expected	102 (21.1)
Hurt more severely than expected more than once	49 (10.0)
Hurt so badly should have been seen by a medical professional (even if not seen)	46 (9.4)

Table 2 (cont). Description of Self-Injurious Behaviors (n=490)

Help Seeking

Sought medical treatment for self-inflicted injuries at any time	32 (6.5)
Anyone knew	315 (64.2)
Been in therapy for any reason	241 (53.0)
Disclosed or discussed self-injurious behavior with mental health professional	105 (21.4)
Physician knew	16 (3.2)
Other health care provider knew	8 (1.6)

* Sum of subgroup numbers is not equal to total N as a result of missing data.

Table 3. Forms and Location of Most Common Self-injurious Acts

Behavior	% of Self-injurers
Severely scratched or pinched with fingernails or objects to the point that bleeding occurred or marks remained on the skin	51.6
Banged or punched objects to the point of bruising or bleeding	37.6
Cut	33.7
Punched or banged oneself to the point of bruising or bleeding	24.5
Ripped or tore skin	15.9
Carved words or symbols into skin	14.9
Interfered with the healing of wounds	13.5
Burned skin	12.9
Rubbed glass, sharp objects into the skin	12.0
Engaged in trichotillomania	11.0
Location of Injury on Body	% of Self-injurers
Arms	47.3
Hands	38.0
Wrists	29.0
Thighs	17.6
Stomach	16.1
Calves	11.0
Head	10.8
Fingers	10.8

Table 4. History of Abuse Risk Factors for Self-Injurious Behaviors*

				Odds Ratio (95% CI)			
No. (%)				Single SIB incident vs. No SIB		>1 SIB Incidents vs. No SIB	
No SIB (n=2381)	Single SIB Incident (n=121)	>1 SIB Incidents (n=347)		Univariate Model	Multivariate Model†	Univariate Model	Multivariate Model†
Sexual abuse							
Yes	217 (9.1)	19 (15.7)	79 (22.7)	1.9 (1.1-3.2)	1.0 (.4-2.0)	3.1‡ (2.3-4.1)	1.8 (1.2-2.8)
No	2164 (90.8)	102 (84.3)	268 (77.2)	1.0	1.0	1.0	1.0
Emotional abuse							
Yes	479 (20.1)	41 (33.8)	165 (47.5)	2.3‡ (1.5-3.4)	1.9§ (1.1-3.3)	4.4‡ (3.4-5.7)	3.7‡ (2.5-5.1)
No	1902 (79.9)	80 (66.1)	182 (52.4)	1.0	1.0	1.0	1.0
Physical Abuse							
Yes	120 (5.2)	10 (8.8)	46 (14.6)	1.7 (.9 – 3.4)	1.3 (.5-3.1)	3.1‡ (2.3-4.1)	1.1 (.7-1.9)
No	2261 (94.8)	111 (91.2)	301 (85.4)	1.0	1.0	1.0	1.0

* Derived from multivariate logistic regression analysis with comorbid mental health conditions entered as predictors of dichotomously coded self-injurious behavior. CI indicates confidence interval.

† All effects were adjusted simultaneously for sex, international student status, age, race/ethnicity, parental education status, sexual orientation, family composition while in high school, and other abuse variables.

‡ $P < .001$.

§ $P < .01$.

|| $P < .05$.

Table 5. Mental Health Condition Correlates for Self-Injurious Behavior*

				Odds Ratio (95% CI)			
No. (%)				Single SIB incident vs. No SIB		>1 SIB Incidents vs. No SIB	
No SIB (n=2381)	Single SIB Incident (n=121)	>1 SIB Incidents (n=347)		Univariate Model	Multivariate Model†	Univariate Model	Multivariate Model†
Suicide ideation, plan, gesture, or attempt							
Within	153 (6.4)	25 (20.6)	135 (38.9)	3.8‡ (2.3-6.1)	3.1‡ (1.8-5.2)	10.6‡ (8.0-14.0)	7.4‡ (5.4-10.1)
Lifetime							
Never	2228 (93.5)	96 (79.3)	212 (61.1)	1.0	1.0	1.0	1.0
Perceived Level of Distress (K-6)							
6-13	1629 (68.4)	65 (53.7)	146 (42.0)	1.0	1.0	1.0	1.0
14-18	627 (26.3)	39 (32.2)	144 (41.4)	1.6 (1.0-2.3)	1.3 (.9-2.1)	2.6‡ (2.0-3.3)	1.8‡ (1.3-2.4)
19-24	93 (3.9)	15 (12.3)	55 (15.8)	4.0‡ (2.2-7.3)	3.1‡ (1.6-6.2)	6.6‡ (4.6-9.7)	3.5‡ (2.2-5.7)
Possess one or more characteristics of eating disorder							
Yes	467 (19.6)	30 (24.8)	157 (45.2)	1.3 (.9-2.0)	1.0 (.6-1.6)	3.6‡ (2.7-4.2)	2.0‡ (1.5-2.7)
No	1914 (80.4)	91 (75.2)	190 (54.8)	1.0	1.0	1.0	1.0

* Derived from multivariate logistic regression analysis with comorbid mental health conditions entered as predictors of dichotomously coded self-injurious behavior. CI indicates confidence interval.

† All effects were adjusted simultaneously for sex, international student status, age, race/ethnicity, parental education status, sexual orientation, and family composition while in high school.

‡ $P < .001$.

§ $P < .01$.

|| $P < .05$.

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